

CAD systems—look before you leap

Mary Simons

Just as the footwear industry has changed over the last decade, so too has the need for computer aided design. Initially, computer-based design systems were thought of as too complex and too expensive. Now, the situation is virtually reversed and no shoe company can ignore the potential such systems offer. There is a wide choice of suppliers. There is also a myriad of factors to take into account.

Screen displays of images have vastly improved recently so that, on the best systems, the appearance of colour, texture, thickness of materials and shadow is very realistic. The images can also be rotated to view them from any angle. This single improvement in imaging goes a long way towards answering one of the biggest criticisms that designers formerly had that the feedback possible from an actual object was infinitely superior to that from a screen.

The ability to confidently make decisions on range building (or even purchase) at this stage transforms and minimises the process of bringing new styles to the market.

Identify your needs

Introducing a new CAD system is a big step that will influence your company's procedures for years and, as such, warrants a carefully considered approach. It is worth setting out what your specific needs are before assessing the systems.

Systems are constantly being updated so, if your otherwise 'perfect' system is currently lacking one aspect, it is

worthwhile discussing this with the supplier. The good ones are continually looking for ways to satisfy the market and should welcome the feedback.

Naturally, potential purchasers may start from differing situations. Some companies will have design expertise coupled with pattern cutting skills and knowledge of the varying demands of machinery and operator skill levels. The designer knows precisely what end result is required, knows how to correct any problem, and does not need to transmit data or patterns around the world.

The opposite extreme would be a company with conceptual design skills at one location, limited pattern cutting skills and knowledge at another and production facilities in several further ones where there is no historical shoemaking industry or tradition. In this case, the system chosen would need to guide the user more and to specialise in the easy exchange of data around the globe. The existence of support staff with pattern cutting expertise within the CAD supplier's company could also be a crucial factor.

What's on offer?

The leading suppliers operate globally with the systems based on English as the most universally understood language; however, they also provide many opportunities to operate or output in other languages.

CAD systems now encompass many functions, usually available in a series of modules to allow users maximum flexibility. Basic pattern grading in 2D is

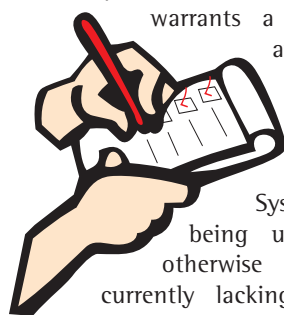


available from many companies, usually based on the input of model patterns via scanners but this hardly counts as 'design'. Real design is the creation of the style lines and this is now typically accomplished in 3D using an image of a last on which a designer can create a style.

The last itself may be created on the CAD system or, more usually, input in numerical form from a file supplied by the last maker or digitised from a model. Model lasts can be laser-scanned to quickly create a numeric file. Once last shapes are filed in the CAD system, they can often be adjusted and blended by the software to create new shapes. Similarly, once the design lines are stored they may be displayed on alternative last shapes.

The 3D upper style can be flattened to create 2D patterns and graded by whatever rules the user chooses. The graded patterns can then be exported to cutting equipment either to produce card patterns for knife making or to cut the upper materials directly.

Leading suppliers have also added optional modules to provide integrated solutions for many related activities. Notable is the ability to scan a wearer's foot as the basis for a last. This has ➤



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Once a user has all the technical aspects of last, upper, heel and sole unit design and grading covered, there is a natural progression to add other functions such as costing packages. Most recently, CAD system suppliers have addressed the need to manage all the resultant data from the design and development activity with product data management modules.

Typical examples

BUSM supplies its basic system on a unique annual subscription basis so that there is no huge initial expense to discourage potential users. The software is deliberately designed to be straightforward to use, thus avoiding the need for user training and to control costs. Technical support is available by phone. The majority of users are small companies or individuals.

Crispin's system features upper design and pattern engineering and grading in 2D as an affordable entry level or in 3D and, through Orisol Asia, now has dedicated links to a sole unit design package incorporating laser scanning for reverse engineering from an existing unit. There is also a costing module.

ElitronCAD was developed by an Italian machinery supply company. It includes last acquisition, 2D or 3D upper design, heel design, pattern grading, nesting and upper material consumption modules followed by a bill of materials and product data management modules. Some CAM aspects such as nesting and consumption have been integrated into the CAD functions to provide the user with immediate information about the need for pattern engineering, etc.

Procam's system benefited from the early realisation that large centralised systems were likely to be replaced by more flexible solutions both in scale and geography. They have specialised in operating globally with communication of data via the internet having been used as the norm for several years. The CAD basis is the Dimensions upper design package which can operate in 2D or 3D and uses a database (of the user's choosing) to file the information.



For increased speed, it actually runs in various languages rather than using language tables.

Design is followed by a material consumption calculation, a document management module, nesting software, a costing function and a product data management module. A measure of the system's success is that the world's largest shoe company uses it while at the same time it is also used by smaller specialist shoemakers. The next phase of development is

a process management system due to be unveiled at Simac 2005.

Lectra also foresaw the need for global operation and offered worldwide connectivity early on. The core of its system is the RomansCAD module which operates in 2D or 3D and is preceded by last acquisition and followed by engineering and grading packages. As Lectra also produces continuous cutting equipment, integrated CAM applications naturally form an important part of its offering.

Delcam came from a completely different background and entered the footwear industry with extensive experience in sophisticated CAD/CAM applications in engineering. They applied this to great effect for sole unit mould design and have since extended the system to take input on last shapes and create upper designs using the Mind software as the basis.

The PS-Shoemaker software can combine the upper and sole unit design and allow the sole to be edited (e.g. change colours) to suit the upper. The resultant combined data can be stored in a secure file format and then viewed by customers. The company is working on nesting software for leather and a web-based database for recording user specified data and

will present these new features at Simac 2005.

ShoemasterQS from CSM3D is arguably the most extensive system currently on offer. It originated in a shoemaking company and is centred on the Creative shoe design module and includes other modules for foot scanning, last creation and heel design followed by a product data management system.

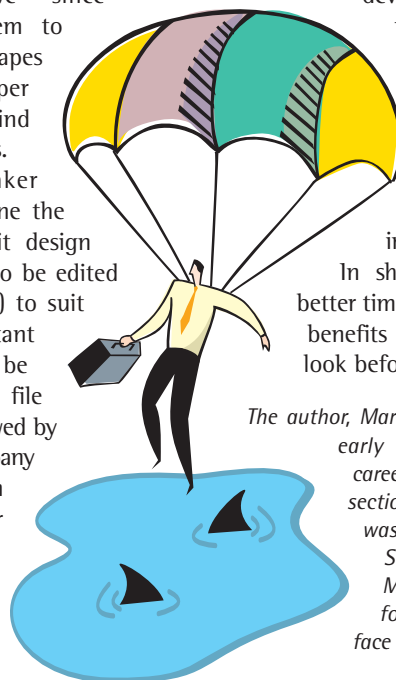
It is possible to start with an entry-level package of 2D pattern engineering and grading. There is also a unique design service offering original designs together with all components by a number of designers in electronic file format. By being part of the Torielli Group, CSM3D is one of the leaders in communication with other specialist companies such as last making, etc.

The future

This article has mentioned some of the more notable CAD suppliers. There are, of course, others, some of whom operate exclusively in their local language. Complex software is time consuming to develop and, as the systems and users become ever more sophisticated, maintenance, updates and service are also very expensive. This has already led to some contraction with companies leaving the sector.

More positively, companies with complementary expertise have formed alliances rather than continue lone development. It is expected that this trend will continue. For the customer this is a prime time as there is a wide choice and the CAD suppliers are making efforts to increase their market share.

In short, there couldn't be a better time to check out the possible benefits for your company—but do look before you leap. 🐸



The author, Mary Simons, has recently taken early retirement after a long career in the Management Services section of SATRA. Much of her time was spent in footwear factories. She also compiled the Shoe Machinery Review publications for many years and is a familiar face at exhibitions.